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SOURCE Radio, No 8, 1951, pp 29-31.

THE SOVIET KAMA RADIO PHONOGRAPH

A. Komarov

The Plant imeni Ordzhonikidze of the Ministry of the Communications Equip-  
ment Industry USSR has started production of the Kama radio phonograph.

The radio receiver part of the Kama is essentially the Moskvich receiver  
with certain improvements. The design and location of the first i-f filter  
have been changed. Most of it was placed within the chassis to facilitate access  
to the converter tube. A modification of the input circuit unit gives ready  
access to parts and assembly. The ratio of the vernier dial was increased  
from 8 to 15 and the dial face was revised. A unified input circuit block was  
used. The Type VS-25-21 selenium rectifier with 24 disks was replaced by a  
Type VS-25-14 rectifier with 19 disks.

Circuit

The schematic diagram of the Kama is very similar to that of the Moskvich  
receiver (Radio, No 3, 1951). Hence, only the differences are indicated here.

When receiving distant stations, the antenna is connected with one jack  
so that the tuned circuit and the antenna are coupled through a 10,000- $\mu$ fd  
capacitor. In receiving local or high-power stations, however, the antenna is  
connected to another jack so that a 43- $\mu$ fd capacitor is connected in series  
with the 10,000- $\mu$ fd capacitor to weaken the coupling between the tuned circuit  
and the antenna. As a result, distortions caused by overloading the output  
stage of the receiver are avoided. A negative feedback connection was intro-  
duced in the output or amplification stage, and the autotransformer and circuit  
coils were modified slightly.

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Design

The Kama comes in a wooden cabinet of dimensions 390 x 225 x 285 mm. The top cover opens to give access to the turntable, driven by a SM-1 synchronous motor, and to the pickup arm, using a Type Z5 magnetic pickup. The phonograph motor is fed from the 220-v section on the line side of the autotransformer.

The phonograph must be played with the cover open, since part of the record projects over the edge of the cabinet. Switching from receiver to phonograph operation is accomplished by raising the cover.

Main Operating Characteristics

The output power is 0.5 w with harmonic content less than 10%. Sensitivity is at least 300  $\mu$ v. Selectivity for a detuning of  $\pm 10$  kc is at least 15 db. Image signal attenuation is at least 20 db.

The variation of the frequency response in the 150-3,500 cps band for both the whole receiver and the record reproduction section from the pickup input does not exceed 20 db.

The harmonic content of the whole receiver channel at frequencies up to 400 cps is less than 15%, and less than 10% above 400 cps. In the record reproduction section it is less than 20% at 200-400 cps, and less than 15% for frequencies above 400 cps.

At the rated output, the average sound pressure of the loud-speaker for the 150-3500 cps band is about 5 bars at a distance of one meter.

The Kama radio phonograph draws 35 w in receiver operation and 65 w in phonograph operation.

The Kama is the cheapest and lightest of all the radio phonographs produced by the Soviet industry.

Acoustical experiments established that the tone quality of the Kama radio phonograph was better than that of the Moskvich receiver in both receiver and phonograph operation. Its greatest defect results from the use of a Type SM-1 synchronous motor. When in operation, the motor produces a strong hum, usually due to play in the bearings, and induces emf's in the pickup which are heard as background noise in the speaker. It also gets out of alignment very quickly. It should be replaced by an induction motor similar to, but lighter than, the DAG used in the Ural radio phonograph. A two-pole motor made for only one voltage, say 127 v, and drawing less power, would be satisfactory. Such a motor might be only about two thirds as large as the DAG mentioned above.

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